Attachment 4

MARRIOTT
165.00 kWp (DC) PHOTOVOLTAIC PV SYSTEM
23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657

SHEET CATALOG

SHEET #	DESCRIPTION
G-01	COVER SHEET
G-02	GENERAL NOTES
E-01	SITE PLAN
E-01.1	ENLARGED SITE PLAN
E-02	ELECTRICAL STRING PLAN
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LOCATION MAP

LOCATION INFORMATION

SITE COORDINATES	:	33.583531, -117.837117
ADDRESS	:	23000 NEWPORT COAST DR
CITY	:	NEWPORT COAST
STATE	:	CA
ZIP	:	92657
COUNTY	:	ORANGE COUNTY
PERMITTING AUTHORITY	:	CA - CITY OF NEWPORT BEACH
INTERCONNECTING UTILITY	:	SDGE

APPLICABLE CODES AND COMPLIANCE

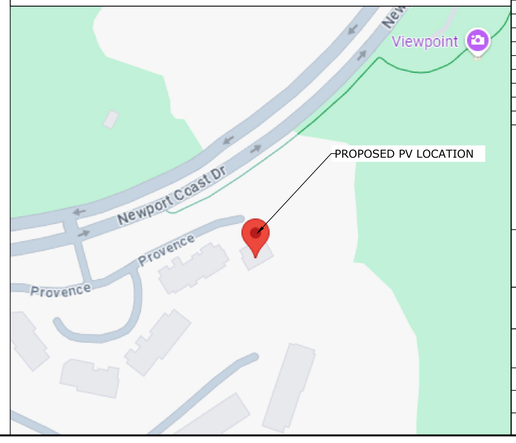
NFPA 70E - STANDARD FOR ELECTRICAL SAFETY IN THE WORKFORCE
UL 61730 - SOLAR MODULES
UL 1741 - INVERTERS
UL 2703 - MOUNTING SYSTEMS AND CLAMPING DEVICES FOR PV MODULES

2022 CALIFORNIA ELECTRICAL CODE
2022 CALIFORNIA BUILDING CODE
2022 CALIFORNIA FIRE CODE
ADDITIONALLY, CONFORM TO ALL LOCAL ORDINANCES AND REQUIREMENTS

PROJECT SUMMARY INFORMATION

DC kWp	165.00
AC kW	150.00
MODULE MFG. & MODEL	APTOS DNA-144-BF10-550W-DG (550W)
MODULE QTY	300
INVERTER MFG. & MODEL	SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)
INVERTER QTY	3
OPTIMIZER	SOLAREDGE S650B POWER OPTIMIZER
OPTIMIZER QTY	300
DC:AC RATIO	1.10
STRINGS	27
MODULES PER STRING	12, 11
RACKING MFG. & MODEL	IRONRIDGE
MODULE TILT	30°
AZIMUTH	184°
INTER-ROW SPACING	0.5", 2.5', 10'-5"

VICINITY MAP



GENERAL NOTES

1. THESE NOTES SET MINIMUM STANDARDS FOR CONSTRUCTION. THE DRAWINGS GOVERN OVER THESE NOTES TO THE EXTENT SHOWN.
2. ALL WORK SHALL CONFORM TO THE MINIMUM STANDARDS OF THE FOLLOWING: LOCAL BUILDING CODE, LOCAL ELECTRICAL CODE, ANY OTHER REGULATING AGENCIES THAT HAVE AUTHORITY OVER ANY PORTION OF THE WORK AND THOSE CODES AND STANDARDS LISTED IN THESE DRAWINGS AND IN THE AGREEMENT.
3. ALL MATERIAL AND EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE CEC.
4. ALL ELECTRICAL WORK AND INSTALLATION TO BE COMPLETED BY A QUALIFIED PERSONNEL, ADJUSTED, ALIGNED AND TESTED BY THE CONTRACTOR AS REQUIRED TO PRODUCE THE INTENDED PERFORMANCE.
5. BEFORE THE COMMENCEMENT OF ANY WORK, EACH TRADE SHALL VERIFY EXISTING CONDITIONS OF ANY DISCREPANCIES TO THAT WHICH IS SHOWN IN THESE DRAWINGS, INCLUDING BUT NOT LIMITED TO DIMENSIONS OF THE WORK AREA, STRUCTURE, EXISTING ELECTRICAL SERVICE, CONDUITS PATHS, OBSTRUCTIONS, ACCESSIBILITY ISSUES, AND WORKING CLEARANCES.
6. UNLESS INDICATED AS EXISTING (E), ALL PROPOSED MATERIALS AND EQUIPMENT ARE NEW.
7. ALL EQUIPMENT SHALL BE MOUNTED AS SHOWN. WHERE DETAILS ARE NOT PROVIDED, THE SUBCONTRACTOR SHALL USE DILIGENT EFFORTS TO MOUNT EQUIPMENT SUCH THAT IT WILL BE CLEAN, LEVEL AND SOLID.
8. ALL SURFACES SHALL BE PATCHED AND PAINTED AROUND NEW DEVICES AND EQUIPMENT TO MATCH EXISTING FINISHES.
9. UPON COMPLETION OF WORK, THE CONTRACTORS SHALL THOROUGHLY CLEAN ALL EXPOSED EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. REMOVE ALL LABELS AND ANY DEBRIS, CRATING OR CARTONS AND LEAVE THE INSTALLATION FINISHED AND READY FOR OPERATION.
10. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ITEMS WITH THE OWNER OR GENERAL CONTRACTOR FURNISHED EQUIPMENT DELIVERY SCHEDULE TO PREVENT UNNECESSARY DELAYS IN THE TOTAL WORK.

ENGINEERING SCOPE OF WORK

1. ILLUMINE INTERNATIONAL INC. HAS ONLY PROVIDED DRAFTING SERVICES FOR THE PERMIT DRAWINGS. NO ACTUAL ENGINEERING WORK, ENGINEERING REVIEW OR ENGINEERING APPROVAL HAS BEEN CONDUCTED BY ILLUMINE INTERNATIONAL INC UNLESS NOTED OTHERWISE.
2. WHEN A PROFESSIONAL ENGINEER APPROVES AND SEALS THE DESIGN FOR COMPONENTS OF THEIR RESPECTIVE DISCIPLINE (STRUCTURAL/ELECTRICAL) SHOWN ON THESE PERMIT DRAWINGS, HE/SHE:
   a. TAKES FULL DIRECT CONTROL OF THE ENGINEERED DESIGN.
   b. IS GIVEN ACCESS TO PERSONALLY SUPERVISE AND RECTIFY ANY ASPECT OF THE ENGINEERED DESIGN.
   c. HAS FULLY ACCEPTED RESPONSIBILITY FOR THE ENGINEERED DESIGN.

PV SCOPE OF WORK:
165 KW (DC) SOLAR SYSTEM TO BE INSTALLED USING IRONRIDGE GROUND MOUNT RACKING. THE STRUCTURE INSTALLED WILL HAVE A MAX HEIGHT OF 2'-11" FROM THE GROUND

B

B

SITE ADDRESS	: 23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657
PARCEL NUMBER	: 477-241-52
OWNER(S)	: NEWPORT COAST VILLAS MASTER ASSOCIATION
OWNER ADDRESS	: 1 MARRIOTT DR WASHINGTON, DC 20058
LEGAL DESC.	: N TR 16164 BLK LOT 18 POR OF LOT 18 OF TRACT 16164
NO. OF UNITS	: N/A
YEAR BUILT	: N/A
BUILDING AREA	: 54,533 SF

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C**	MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR,
NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i
ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

COVER SHEET

DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

PAPER SIZE: 24" X 36"

SCALE: AS NOTED	REV:B
DATE: 05/07/2025	G-01

GENERAL NOTES: CEC 2022

1. INVERTERS, MOTOR GENERATORS, PV MODULES, AC MODULES AND AC MODULE SYSTEMS, DC COMBINERS, DC-TO-DC CONVERTERS, RAPID SHUTDOWN EQUIPMENT, DC CIRCUIT CONTROLLERS, AND CHARGE CONTROLLERS INTENDED FOR USE IN PV SYSTEMS SHALL BE LISTED OR BE EVALUATED FOR THE APPLICATION AND HAVE A FIELD LABEL APPLIED. [CEC 690.4(B)]
2. ALL OUTDOOR EQUIPMENT SHALL BE NEMA 3R RATED, INCLUDING ALL ROOF MOUNTED TRANSITION BOXES AND SWITCHES.
3. ALL EQUIPMENT SHALL BE PROPERLY GROUNDED AND BONDED IN ACCORDANCE WITH CEC ARTICLE 250.
4. PV SYSTEM DC CIRCUIT AND INVERTER OUTPUT CONDUCTORS AND EQUIPMENT SHALL BE PROTECTED AGAINST OVERCURRENT. [CEC 690.9(A)]
5. THE UTILITY INTERACTIVE INVERTERS SHALL TRIP OR SHALL BE PERMITTED TO AUTOMATICALLY DISCONNECTED FROM ALL UNGROUNDED CONDUCTORS OF THE PRIMARY SOURCE WHEN ONE OR MORE OF THE PHASES OF THE PRIMARY SOURCE TO WHICH IT IS CONNECTED OPENS. THE INTERACTIVE ELECTRIC POWER PRODUCTION EQUIPMENT SHALL NOT BE RECONNECTED TO THE PRIMARY SOURCE UNTIL ALL THE PHASES OF THE PRIMARY SOURCE TO WHICH IT IS CONNECTED ARE RESTORED. [CEC 705.40]
6. EQUIPMENT DISCONNECTING MEANS SHALL HAVE RATINGS SUFFICIENT FOR THE MAXIMUM CIRCUIT CURRENT, VOLTAGE, AND AVAILABLE FAULT CURRENT. THE DISCONNECTING MEANS SHALL SIMULTANEOUSLY DISCONNECT ALL CURRENT-CARRYING CONDUCTORS THAT ARE NOT SOLIDLY GROUNDED WHICH IT IS CONNECTED TO AND SHALL BE OPERABLE WITHOUT EXPOSING THE OPERATOR TO ANY ENERGIZED PARTS OF THE DISCONNECT. [CEC 690.15(C)]
7. ALL CONDUCTORS EXPOSED TO WEATHER SHALL BE LISTED AND IDENTIFIED FOR USE IN DIRECT SUNLIGHT. [CEC 310.10(D)]
8. THE MODULE CONDUCTORS MUST BE TYPE USE-2 OR LISTED FOR PHOTOVOLTAIC (PV) WIRE. [CEC 690.31(C)(1)]
9. PV SYSTEM DC CIRCUIT CONDUCTORS SHALL BE IDENTIFIED AT ALL TERMINATIONS, CONNECTIONS, AND SPLICE POINTS BY COLOR CODING, MARKING TAPE, TAGGING, OR OTHER APPROVED MEANS. [CEC 690.31(B)(2)]
10. ALL GROUNDED CONDUCTORS SHALL BE PROPERLY COLOR IDENTIFIED AS WHITE OR GRAY. [CEC 200.6]
11. PV SYSTEM CONNECTED ON THE LOAD SIDE OR SOURCE SIDE OF THE SERVICE DISCONNECTING MEANS OF THE OTHER SOURCE(S) AT ANY DISTRIBUTION EQUIPMENT ON THE PREMISES SHALL BE IN ACCORDANCE WITH CEC 705.11 (SERVICE CONNECTION) & 705.12 (LOAD SIDE).
12. EACH SOURCE CONNECTION SHALL BE MADE AT A DEDICATED CIRCUIT BREAKER OR FUSIBLE DISCONNECTING MEANS.
13. THE SUM OF THE AMPERE RATING OF THE OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO THE BUSBAR OR CONDUCTOR SHALL NOT EXCEED 120% OF THE RATING OF THE BUSBAR OR CONDUCTOR AND THE INTERCONNECTION POINT SHALL BE LOCATED AT THE OPPOSITE END OF OF THE BUSBAR AS THE PRIMARY POWER SOURCE. [CEC.12(B)(2)]
14. THE INTERCONNECTION POINT OF PRODUCTION EQUIPMENT SHALL BE CONNECTED TO THE SUPPLY SIDE OF THE GROUND-FAULT PROTECTION EQUIPMENT INSTALLED IN AC CIRCUITS AS REQUIRED ELSEWHERE IN THIS CODE, BUT SHALL BE PERMITTED TO BE MADE TO THE LOAD SIDE OF THE GROUND-FAULT PROTECTED EQUIPMENT PROVIDED THERE IS GROUND-FAULT PROTECTION FOR EQUIPMENT FROM ALL GROUND-FAULT CURRENT SOURCES. [CEC 705.32]
15. EQUIPMENT CONTAINING OVERCURRENT DEVICES IN CIRCUITS SUPPLYING POWER TO A BUS BAR OR CONDUCTOR SHALL BE MARKED TO INDICATE THE PRESENCE OF ALL SOURCES. [CEC 705.30(C)]
16. FUSED DISCONNECTS, UNLESS OTHERWISE MARKED, SHALL BE CONSIDERED SUITABLE FOR BACKFEED. CIRCUIT BREAKERS NOT MARKED "LINE" AND "LOAD" SHALL BE CONSIDERED SUITABLE FOR BACKFEED. CIRCUIT BREAKERS MARKED "LINE" AND "LOAD" SHALL BE CONSIDERED SUITABLE FOR BACKFEED OR REVERSE CURRENT IF SPECIFICALLY RATED. [CEC 705.30(D)]
17. ALL THE CEC REQUIRED WARNING SIGNS, MARKINGS, AND LABELS SHALL BE POSTED ON EQUIPMENT AND DISCONNECTS PRIOR TO ANY INSPECTIONS TO BE PERFORMED BY THE BUILDING DEPARTMENT INSPECTOR.
18. FLEXIBLE, FINE-STRANDED CABLES SHALL BE TERMINATED ONLY WITH TERMINALS, LUGS, DEVICES OR CONNECTOR IN ACCORDANCE WITH CEC 110.14. [CEC 690.31(C)(5)]
19. CONNECTORS SHALL BE OF LATCHED OR LOCKING TYPE. CONNECTORS THAT ARE READILY ACCESSIBLE AND OPERATING AT OVER 30 VOLTS DC OR 15 VOLTS AC SHALL REQUIRE TOOL TO OPEN AND MARKED "DO NOT DISCONNECT UNDER LOAD" OR "NOT FOR CURRENT INTERRUPTING". [CEC 690.33(C) & (D)]
20. EQUIPMENT GROUNDING CONDUCTOR FOR PV SYSTEMS WITHOUT GROUND FAULT PROTECTION (GFP) AND INSTALLED ON NON-DWELLING UNIT MUST HAVE AMPACITY OF AT LEAST #10 AWG.
21. GROUNDING ELECTRODE CONDUCTOR WILL BE CONTINUOUS. [CEC 250.64(C)]
22. EQUIPMENT PROPOSED TO BE MOUNTED ON EXTERIOR WALLS OR RACKING ARE TO MAINTAIN CLEARANCE TO OPERABLE WINDOWS PER MANUFACTURERS RECOMMENDATION AND CODE.

EQUIPMENT:

1. EQUIPMENT COMPONENTS SHALL BE LISTED AND LABELED BY A NATIONALLY-RECOGNIZED TESTING LABORATORY(NRTL), SUCH AS UL OR ETL, WHERE SUCH LISTING IS AVAILABLE FOR THE APPLICATION.
2. DANGER, WARNING, AND CAUTION LABELS SHALL BE PROVIDED AS REQUIRED BY NESC, OR OSHA STANDARDS ON EQUIPMENT ENCLOSURED, DOORS, ACCESS PLATES, AND BARRIERS. LABEL ALL MEDIUM VOLTAGE EQUIPMENT WITH THE OPERATING VOLTAGE.
3. ALL OPENINGS INTO EQUIPMENT SHALL BE SEALED WITH GALVANIZED STEEL PLATE OR SCREEN TO PREVENT INSECTS AND RODENTS FROM ENTERING.
4. ALL CONDUCTORS SHALL BE ROUTED TO MAINTAIN ACCESS TO INDICATORS, VALVES, SAMPLE PORTS, SWITCHES, TAP CHANGES, FUSE WELLS, AND OTHER COMPONENTS AND ACCESSORIES REQUIRING OPERATOR ACCESS.
5. INSTALL BOLLARDS AS REQUIRED.

ELECTRICAL NOTES FOR NEW PHOTOVOLTAIC SYSTEM:

1. THIS PROPOSED SOLAR ELECTRIC SYSTEM IS INTENDED TO OPERATE IN PARALLEL WITH POWER RECEIVED FROM THE UTILITY SERVICE PROVIDER.
2. THE INVERTER FOR THE PROPOSED SOLAR ELECTRIC SYSTEM SHALL BE IDENTIFIED FOR USE IN SOLAR PHOTOVOLTAIC SYSTEMS. ALL EQUIPMENT SHALL BE UL APPROVED.
3. THIS SYSTEM IS INTENDED TO CONNECT TO THE EXISTING FACILITY POWER SYTEM AT A SINGLE POINT, POINT OF COMMON COUPLING (POCC). THIS CONNECTION SHALL BE IN COMPLIANCE WITH THE NEC.
4. ALL SOURCE CIRCUITS SHALL HAVE INDIVIDUAL SOURCE CIRCUIT PROTECTION, AS REQUIRED, FOR TESTING AND ISOLATION.
5. ALL DISCONNECTS AND COMBINERS SHALL BE SECURED FROM UNAUTHORIZED OR UNQUALIFIED PERSONNEL BY LOCK OR LOCATION.
6. ALL DISCONNECTS, COMBINERS, PULL/SPLICE BOXES, AND ENCLOSURES SHALL BE LISTED FOR ITS PURPOSE.
7. EQUIPMENT SHALL BE INSTALLED IN A SECURE AREA. INVERTER PERFORMANCE MAY BE AFFECTED IF INSTALLED IN DIRECT SUNLIGHT.

WIRING AND WIRING METHODS:

1. THE EXPOSED PV SOLAR MODULE WIRING AND PV SOURCE CIRCUITS TO BE UV RESISTANT, RATED FOR WET CONDITIONS, AND USE 2,000V PV WIRE WITH A TEMPERATURE RATING OF 90°C.
2. ALL EXPOSED CABLES, SUCH AS MODULE LEADS, SHALL BE SECURED IN A NEAT WORKMANLIKE MANNER TO PREVENT CHAFFING, SWINGING, AND EXCEEDING MINIMUM BEND RADIUS WITH PROPER MECHANICAL SUNLIGHT-RESISTANT MEANS AND ROUTED TO AVOID DIRECT EXPOSURE TO SUNLIGHT AT ALL TIMES.
3. ALL FIELD WIRING THAT IS NOT COLOR-CODED SHALL BE TAGGED AT BOTH ENDS WITH PERMANENT WIRE MARKERS TO IDENTIFY POLARITY AND GROUND.
4. FLEXIBLE METAL CONDUIT IS SUITABLE FOR INSTALLATION IN DRY LOCATIONS; SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 48 INCHES APART.
5. LIQUID-TIGHT FLEXIBLE METAL AND NON-METALLIC CONDUIT IS SUITABLE FOR INSTALLATION IN WET AND DRY LOCATIONS. SHOULD IT BE EMPLOYED, SUPPORTS WILL BE NO MORE THAN 12 INCHES FROM BOXES (JUNCTION BOX, CABINETS, OR CONDUIT FITTING) AND NO MORE THAN 36 INCHES APART.
6. PVC CONDUIT AND FITTINGS SHALL NOT BE USED ON ROOFTOP CONDITIONS OR EXPOSED TO DIRECT SUNLIGHT. WHEN USED IN AN ACCEPTABLE LOCATION, CONDUIT SHALL BE SCHEDULE 80 UV RESISTANT UNLESS NOTED OTHERWISE.
7. FUSES AND WIRES SUBJECT TO TEMPERATURE CONDITIONS GREATER THAN 100°F OR TRANSFORMER INRUSH CURRENT SHALL BE SIZED ACCORDINGLY.
8. THE PHOTOVOLTAIC SOURCE CIRCUITS AND PHOTOVOLTAIC OUTPUT CIRCUITS OF THIS PROPOSED SOLAR SYSTEM SHALL NOT BE CONTAINED IN THE SAME RACEWAY CABLE TRAY, CABLE, OUTLET BOX, OR SIMILAR FITTING AS FEEDERS OR BRANCH CIRCUITS OF OTHER SYSTEMS UNLESS THE CONDUCTORS OF THE DIFFERENT SYSTEMS ARE SEPARATED BY A PARTITION OR ARE CONNECTED TOGETHER.
9. ALL TERMINATIONS SHALL HAVE ANTI-OXIDANT COMPOUND AND BE TORQUED PER DEVICE LISTED OR MANUFACTURER'S RECOMMENDATION.
10. SPLIT BOLTS/SPLICED/CONNECTORS ARE PERMITTED ON THE AC CONDUCTORS AND SHALL BE INSULATED WITH APPROVED MEANS. SPLICES ON DC CONDUCTORS ARE PERMITTED WITH THE APPROPRIATE CONDUCTORS PER THE CEC CODE.
11. NO PVC CONDUIT ALLOWED ON ROOF, UNLESS OPEN-ENDED WIRE MANAGEMENT < 10'.

GROUNDING:

1. EQUIPMENT GROUNDING CONDUCTORS MAY BE COPPER OR ALUMINUM.
2. PARTS OF THE ELECTRICAL INSTALLATION TO BE GROUNDED AND BONDED SHALL INCLUDE, BUT NOT BE LIMITED TO, ELECTRICAL EQUIPMENT, RACEWAYS, BOXES, CABINETS, AND OTHER NON-CURRENT CARRYING METAL PARTS OF THE WIRING SYSTEM, METAL CONDUIT, SWITCHGEAR, HOUSING AND NEUTRALS OF TRANSFORMERS, LIGHTING FIXTURES, AND PANEL DEVICES AS APPLICABLE TO EQUIPMENT INSTALLED ON THIS PROJECT.
3. RACKING COMPONENTS AND STRUCTURAL SUPPORTS MUST BE ELECTRICALLY BONDED TOGETHER BY AN ACCEPTABLE MEANS.
4. MODULES SHALL BE GROUNDED PER MODULE AND RACKING MANUFACTURER'S INSTALLATION GUIDELINES. BARE COPPER USED FOR GROUNDING SHALL NOT TOUCH THE ALUMINUM OF THE MODULE FRAMES.
5. AN EQUIPMENT GROUNDING CONDUCTOR BETWEEN A PV ARRAY AND OTHER EQUIPMENT SHALL BE REQUIRED IN ACCORDANCE WITH CEC ARTICLE 250.

DISCONNECTING MEANS:

1. MEANS SHALL BE PROVIDED TO DISCONNECT ALL CURRENT CARRYING CONDUCTORS OF THE PHOTOVOLTAIC POWER SOURCE FROM ALL OTHER CONDUCTORS IN THE BUILDING.
2. THE GROUNDED CONDUCTOR MAY HAVE A BOLTED OR TERMINAL DISCONNECTING MEANS TO ALLOW MAINTENANCE OR TROUBLESHOOTING BY QUALIFIED PERSONNEL.
3. EQUIPMENT SUCH AS PHOTOVOLTAIC SOURCE CIRCUITS, OVERCURRENT DEVICES, AND BLOCKING DIODES SHALL BE PERMITTED ON THE PHOTOVOLTAIC SIDE OF THE PHOTOVOLTAIC DISCONNECTING MEANS.
4. MEANS SHALL BE PROVIDED TO DISCONNECT EQUIPMENT SUCH AS INVERTERS, BATTERIES, CHARGE CONTROLLERS, AND THE LIKE FROM ALL UNGROUNDED CONDUCTORS OF ALL SOURCES. IF THE EQUIPMENT IS ENERGIZED FROM MORE THAN ONE SOURCE, THE DISCONNECTING MEANS SHALL BE GROUPED AND IDENTIFIED.
5. FUSES AND DISCONNECTING MEANS SHALL BE PROVIDED TO DISCONNECT A FUSE FROM ALL SOURCES OF SUPPLY IF THE FUSE IS ENERGIZED FROM BOTH DIRECTIONS AND IS ACCESSIBLE TO OTHER THAN QUALIFIED PERSONS. SUCH A FUSE IN A PHOTOVOLTAIC SOURCE CIRCUIT SHALL BE CAPABLE OF BEING DISCONNECTED INDEPENDENTLY OF FUSES IN OTHER PHOTOVOLTAIC SOURCE CIRCUITS.

CONTRACTOR PROCEDURAL NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR THOROUGHLY INSPECTING THE SITE AND BECOMING FAMILIAR WITH ALL ASPECTS OF EXISTING CONDITIONS PRIOR TO COMMENCING CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONFIRM THAT THE DRAWINGS AND SPECIFICATIONS ACCURATELY DEPICT AND ACCOUNT FOR THE EXISTING CONDITIONS. ANY LACK OF DETAIL REGARDING EXISTING CONDITIONS IN THE DRAWINGS OR SPECIFICATIONS DOES NOT RELIEVE THE CONTRACTOR FROM PROVIDING ANY MATERIALS OR PERFORMING ANY WORK REQUIRED BY THE DESIGN DOCUMENTATION.
2. THE CONTRACTOR SHALL PROCURE ALL NECESSARY PERMITS PRIOR TO STARTING CONSTRUCTION.
3. ANY DEFICIENCIES, ERRORS, INCONSISTENCIES, OR CONFLICTS BETWEEN OBSERVED FIELD CONDITIONS AND THOSE DEPICTED IN THE DESIGN DRAWINGS SHOULD BE NOTED. CONTRACTOR SHALL CONFIRM ALL DIMENSIONS WITH FIELD MEASUREMENTS PRIOR TO STARTING WORK AND REPORT ANY DISCREPANCIES TO ENGINEER OF RECORD.
4. THE CONTRACTOR SHALL REVIEW ALL CIVIL, ARCHITECTURAL, AND MECHANICAL DRAWINGS AND COORDINATE THE ELECTRICAL WORK WITH THE OTHER TRADES. IF CONFLICTS, DISCREPANCIES, OR DEFICIENCIES ARE FOUND WHICH REQUIRE REVISIONS TO THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF RECORD. BEFORE PROCEEDING WITH THE INSTALLATION, CONTRACTOR MUST OBTAIN WRITTEN DIRECTION ON ANY REQUIRED MODIFICATIONS TO THE DESIGN.
5. ALL EQUIPMENT SHALL BE INSTALLED AS PER THE MANUFACTURER'S INSTRUCTIONS OR PER THE ENGINEER'S CONSTRUCTION DESIGN DOCUMENTS. THE CONTRACTOR SHALL REVIEW AND UNDERSTAND ALL ENGINEERING DRAWINGS AND COMPONENT MANUALS PRIOR TO THE INSTALLATION OR ENERGIZING OF ANY EQUIPMENT. THE CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING AND OPERATING ALL INVERTERS IN ACCORDANCE WITH THE LATEST MANUFACTURER'S INSTALLATION AND OPERATION DOCUMENTATIONS, INCLUDING ALL MANUFACTURER'S TECHNICAL BULLETINS AND UPDATES.
6. THE CONTRACTOR SHALL INSTALL SYSTEM INTERCONNECTION AS REQUIRED BY UTILITY INTERCONNECTION STANDARDS.
7. ANY CHANGES TO OR DEVIATIONS FROM THE DESIGN MADE PRIOR TO THE RECEIPT OF WRITTEN APPROVAL BY THE ENGINEER OF RECORD ARE DONE AT THE CONTRACTOR'S SOLE RISK. THE CONTRACTOR SHALL SUBMIT WRITTEN REQUESTS FOR INFORMATION (RFI) FOR ANY DISCREPANCIES OR PROPOSED CHANGES. RFIS WILL INCLUDE DETAILED SUBMITTALS FOR REVIEW AND APPROVAL BY THE ENGINEER OF RECORD.
8. IT IS THE CONTRACTOR'S RESPONSIBILITY TO RECEIVE, STORE, AND SECURE ALL EQUIPMENT PRIOR TO AND DURING INSTALLATION.

ELECTRICAL ABBREVIATION:

ACP	ACCUMULATION PANEL
A, AMP	AMPERE
AF	AMP FRAME
AIC	AMPERE INTERRUPTING CAPACITY
APPROX	APPROXIMATE(LY)
AL	ALUMINUM
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
CB	CIRCUIT BREAKER
CONC	CONCRETE
CEC	CALIFORNIA ELECTRICAL CODE
Cu	COPPER
CT	CURRENT TRANSFORMER
DIA	DIAMETER
DISC	DISCONNECT
(E)	EXISTING
EC	ELECTRICAL CONTRACTOR
EMT	ELECTRICAL METALLIC TUBING
EM	EMERGENCY
ENC	ENCLOSURE, ENCLOSED
EV	ELECTRIC VEHICLE
EVCS	ELECTRIC VEHICLE CHARGING STATION
FMC	FLEXIBLE METAL CONDUIT
G, GND	GROUND OR GROUNDING
GA	GALVANIZED
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
IN	INCHES
J, JB	JUNCTION BOX
KCMIL	THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT - AMPERE
KWp	KILOWATT PEAK
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MSP	MAIN SERVICE PANEL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MLO	MAIN LUGS ONLY
N, NEUT	NEUTRAL
(N)	NEW
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NTS	NOT TO SCALE
OCPD	OVERCURRENT PROTECTIVE DEVICE
OH	OVERHEAD
P	POLE
PT	POTENTIAL TRANSFORMER
PV	PHOTOVOLTAIC
PVC	POLYVINYL CHLORIDE
RMC	RIGID METAL CONDUIT
SCH	SCHEDULE
SP	SPARE
TX, XFMR	TRANSFORMER
TB	TERMINAL BLOCK
TBD	TO BE DETERMINED
TYP	TYPICAL
UG	UNDERGROUND
UON	UNLESS OTHERWISE NOTED

LEGEND:

MODULES	DRIVE WAY		WHEEL STOPS
EQUIPMENT	SETBACK		PROPERTY LINE
OBSTRUCTION	AC CONDUIT RUN (ABOVE GROUND)		PEDESTAL
INVERTER	AC CONDUIT RUN (UNDERGROUND)		EV CHARGER
TRANSFORMER	DC CONDUIT RUN (ABOVE GROUND)		FUSED DISCONNECT
METER	DC CONDUIT RUN (UNDERGROUND)		SIGNAGE (LOCATION)
NON-FUSED DISCONNECT	CIRCUIT BREAKER		SAFETY BOLLARD

GENERAL CONDUCTOR INSULATION KEY	
DC CONDUCTORS	
POSITIVE (UNGROUNDED)	RED
NEGATIVE (UNGROUNDED)	BLACK
120/240V AC CONDUCTORS	
PHASE A	BLACK
PHASE B	RED
120/208V OR 240V AC CONDUCTORS	
PHASE A	BLACK
PHASE B	RED (SEE NOTE)
PHASE C	BLUE
277/480V AC CONDUCTORS	
PHASE A	BROWN
PHASE B	ORANGE
PHASE C	YELLOW
347/600V AC CONDUCTORS	
PHASE A	BROWN
PHASE B	ORANGE
PHASE C	YELLOW
NEUTRAL	WHITE OR GREY
GROUND	GREEN OR BARE Cu

NOTE: ON THREE PHASE HIGH LEG DELTA SYSTEMS, HIGH LEG MUST BE ORANGE, AS PER REQUIRED BY NFPA 70.

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C**	MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i

ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

GENERAL NOTES

DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

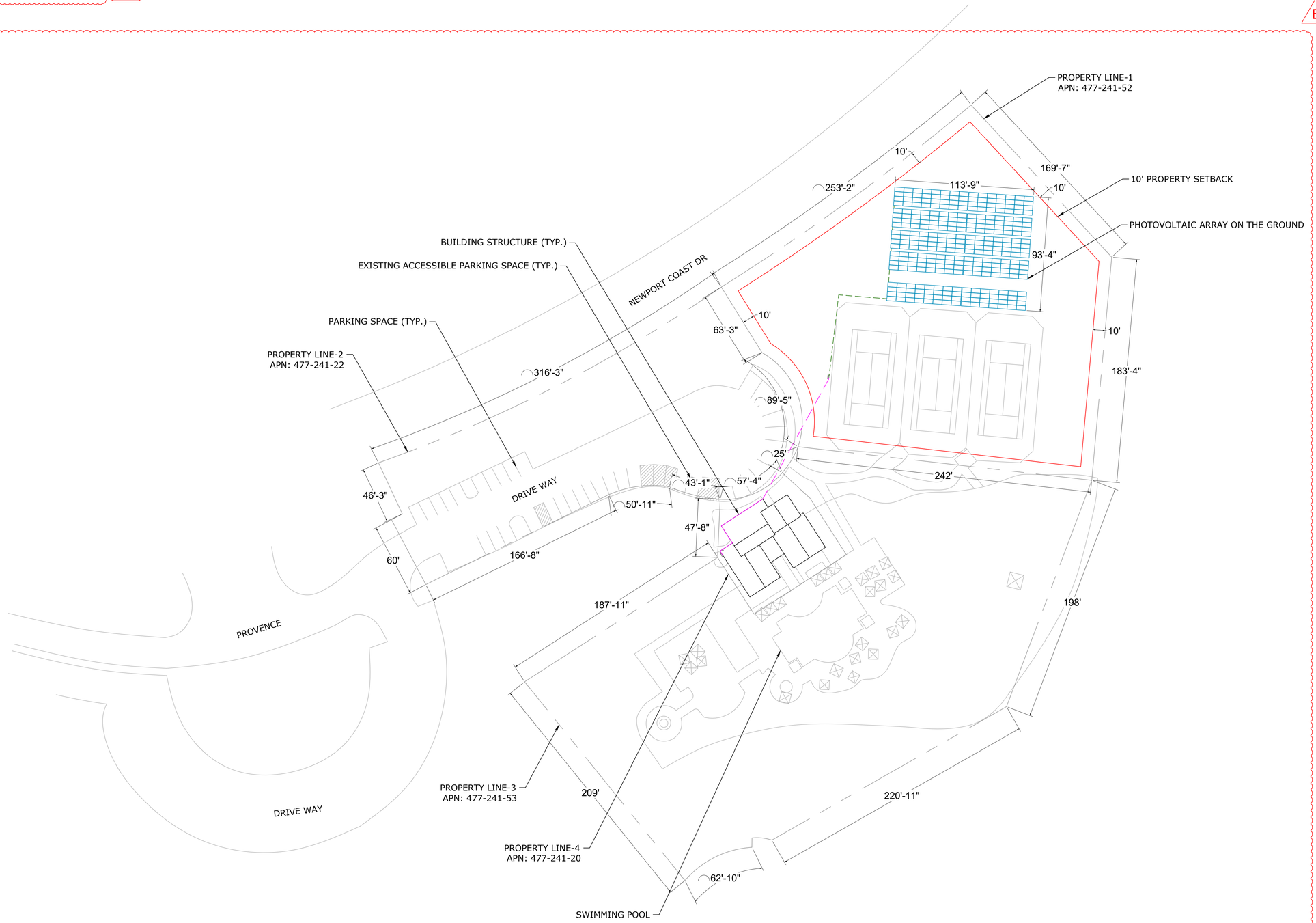
PAPER SIZE: 24" X 36"

SCALE: AS NOTED	REV:B
DATE: 05/07/2025	G-02

SITE PLAN:

NOTE:
1.NO GRADING WOULD BE REQUIRED FOR THIS PROJECT.
2.PARCEL NOS ARE OWNED BY NEWPORT COAST VILLAS MASTER ASSOCIATION.

B



B

SCALE:1"=40'-0"

N

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C**	MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR,
NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

ELECTRICAL SITE PLAN

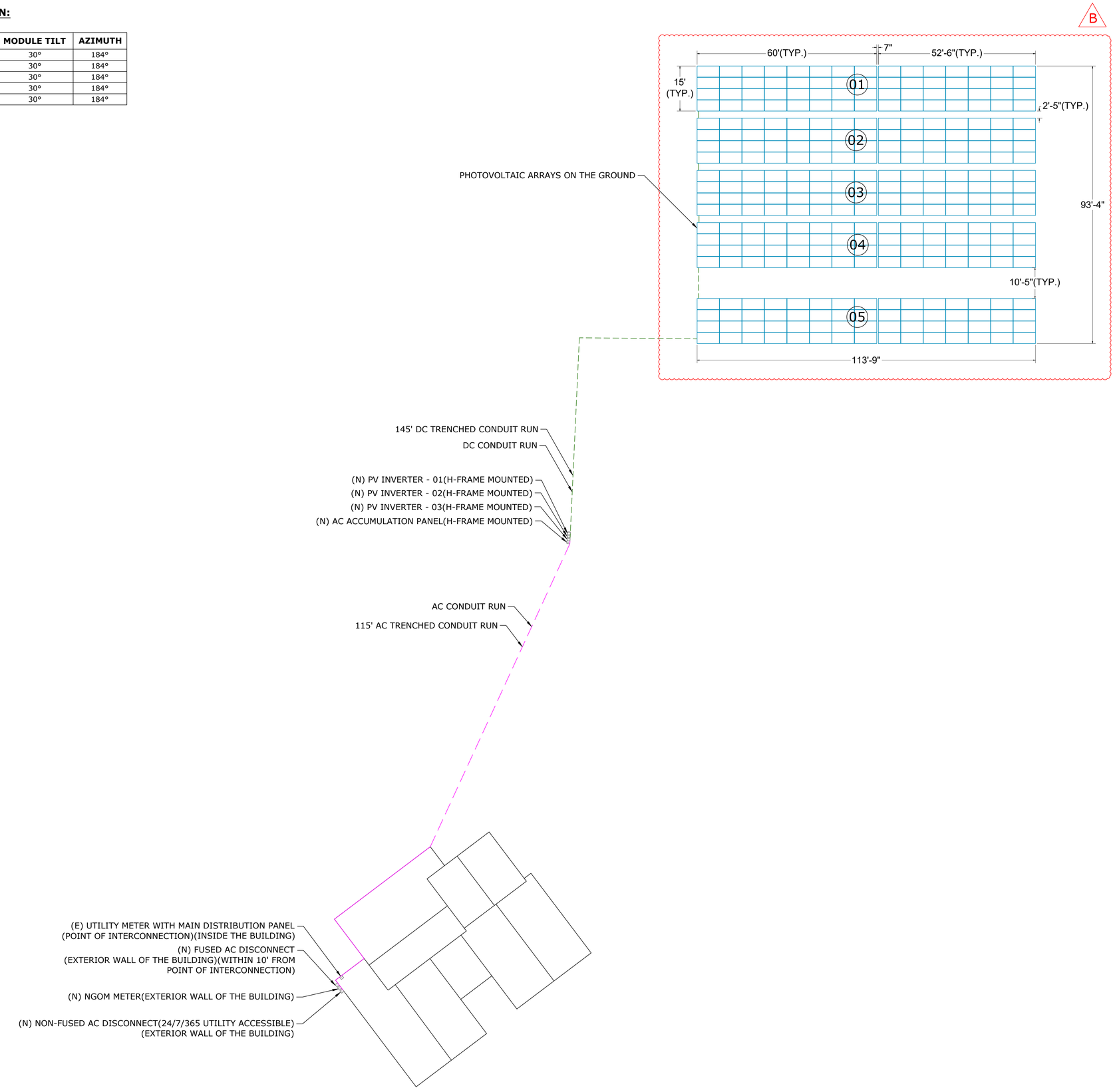
DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

PAPER SIZE: 24" X 36"

SCALE: AS NOTED	REV:B
DATE: 05/07/2025	E-01

ENLARGED SITE PLAN:

ARRAY	QUANTITY	MODULE TILT	AZIMUTH
ARRAY-01	60	30°	184°
ARRAY-02	60	30°	184°
ARRAY-03	60	30°	184°
ARRAY-04	60	30°	184°
ARRAY-05	60	30°	184°



SCALE:1/16" = 1'-0"

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C** | MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR,
NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

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REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i

ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

ENLARGED SITE PLAN

DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

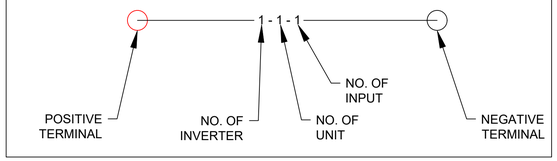
PAPER SIZE: 24" X 36"

SCALE: AS NOTED | REV:B

DATE: 05/07/2025 | E-01.1

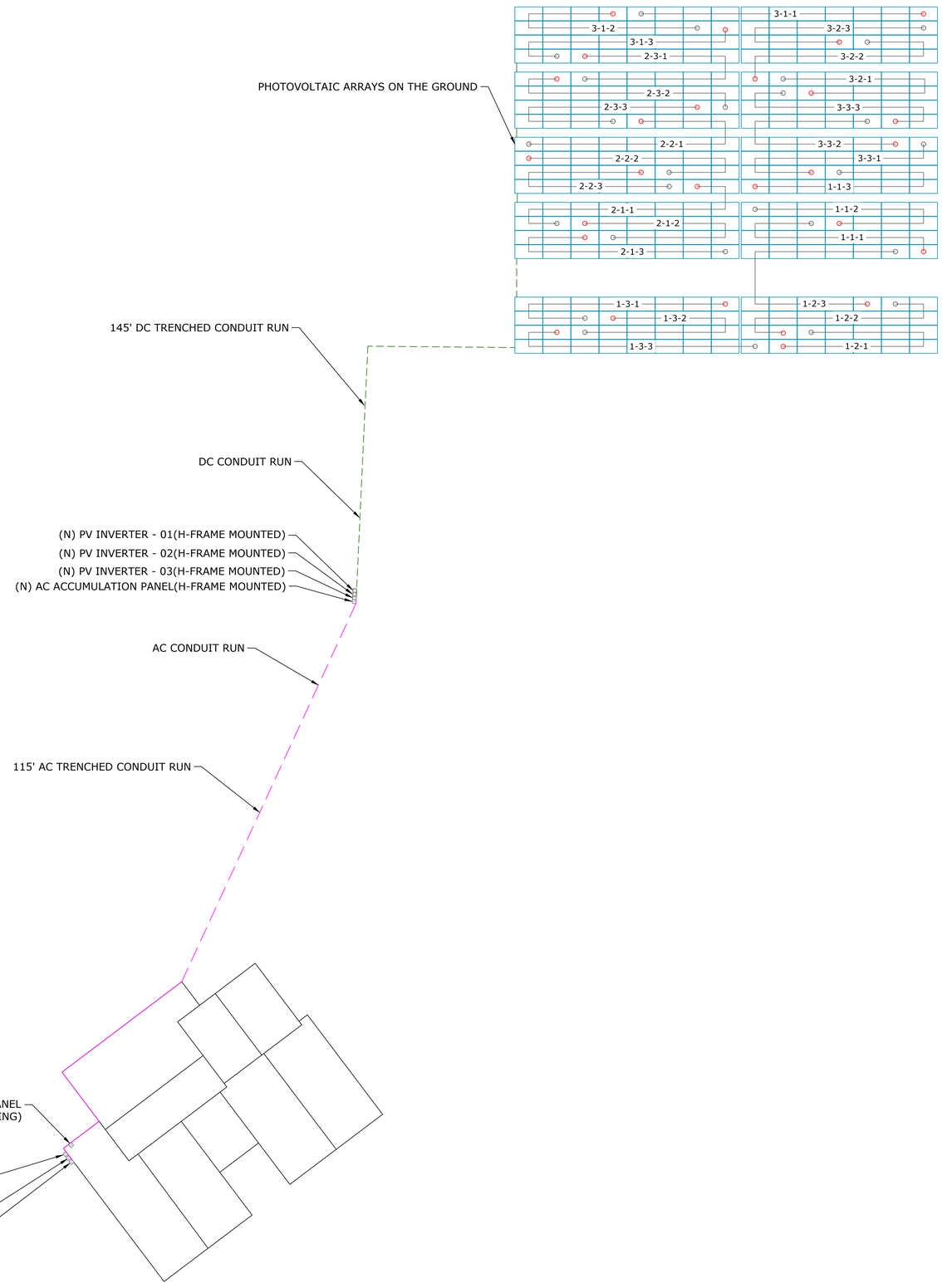
ELECTRICAL STRING PLAN:

LEGEND:



STRINGING DETAILS

STRING	QTY.	STRING	QTY.	STRING	QTY.
1-1-1	11	2-1-1	12	3-1-1	11
1-1-2	11	2-1-2	11	3-1-2	11
1-1-3	11	2-1-3	11	3-1-3	11
1-2-1	11	2-2-1	12	3-2-1	11
1-2-2	11	2-2-2	11	3-2-2	11
1-2-3	11	2-2-3	11	3-2-3	11
1-3-1	11	2-3-1	12	3-3-1	11
1-3-2	11	2-3-2	11	3-3-2	11
1-3-3	11	2-3-3	11	3-3-3	11



SCALE:1/16" = 1'-0"

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C** | MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR,
NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i
ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

ELECTRICAL STRING PLAN

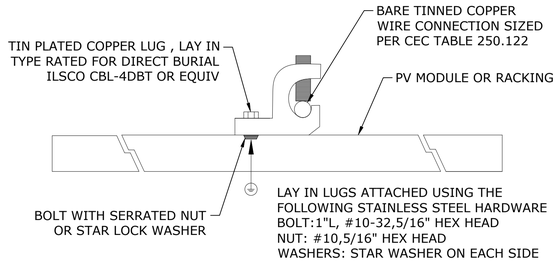
DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

PAPER SIZE: 24" X 36"

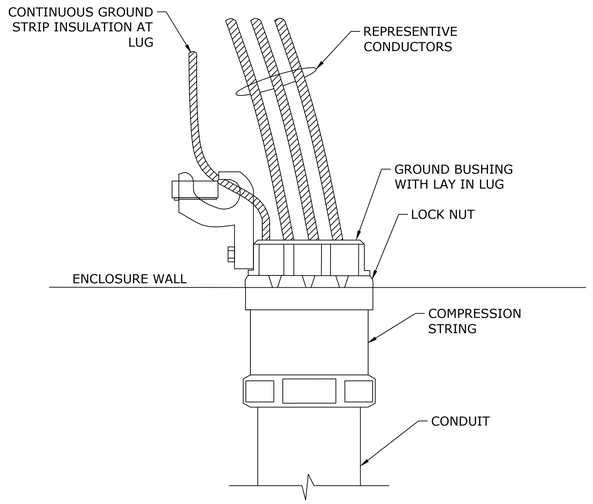
SCALE: AS NOTED | REV:B

DATE: 05/07/2025 | E-02

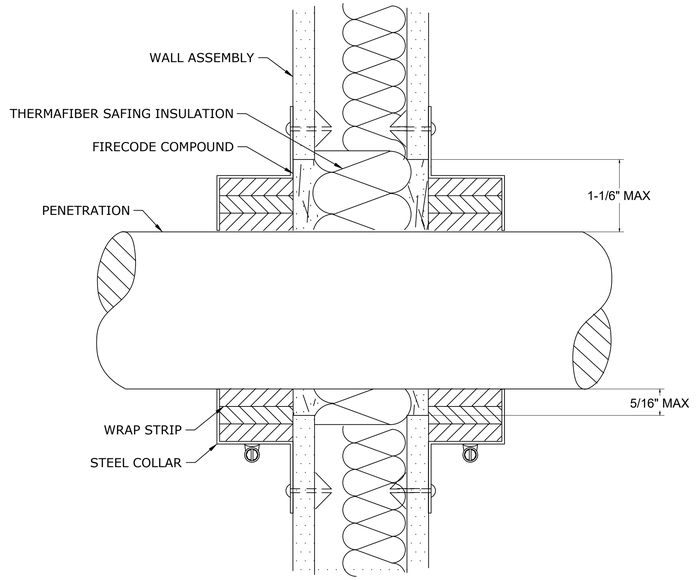
GROUND LUG DETAIL:



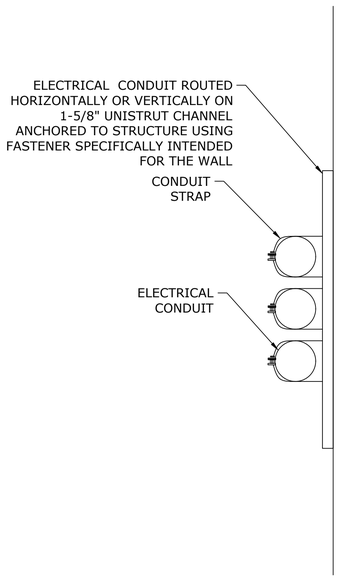
CONDUIT BODY GROUNDING DETAIL:



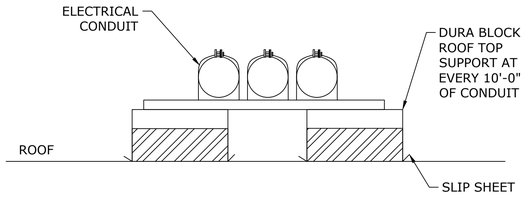
FIRE WALL PENETRATION DETAIL:



TYPICAL CONDUIT WALL ANCHORING:



TYPICAL DURA-BLOCK CONDUIT SUPPORT DETAIL:



NOTE: DETAIL DRAWINGS ARE FOR REFERENCE ONLY

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C**	MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i
ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

ELECTRICAL MOUNTING DETAILS

DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

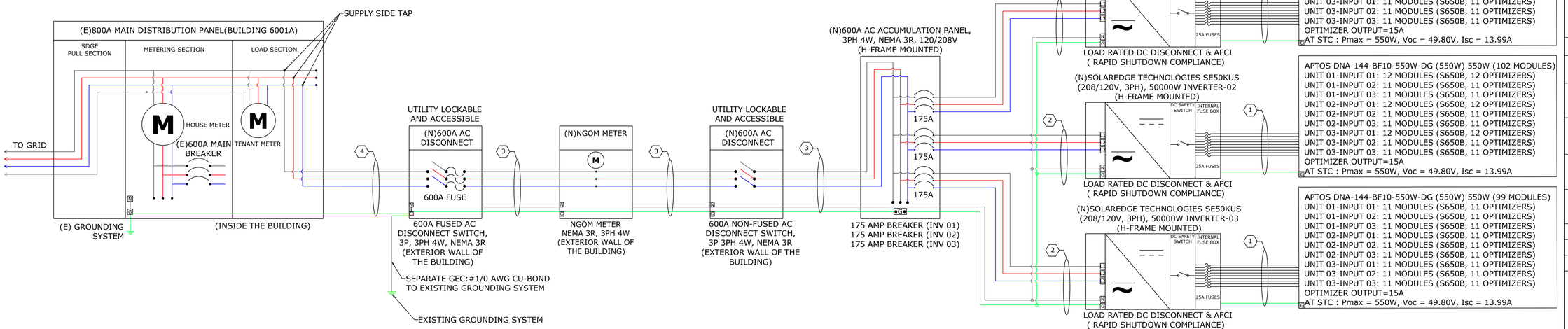
PAPER SIZE: 24" X 36"

SCALE: AS NOTED	REV:B
DATE: 05/07/2025	E-03

LINE DIAGRAM: DC SYSTEM SIZE: **165.00**kWp, AC SYSTEM SIZE: **150.00**kW

NOTE:
1.THIS INSTALLATION IS TO BE CONSIDERED SUPERVISED. ALL NEW ADDITIONS AND ALTERATIONS TO ANY EQUIPMENT IDENTIFIED IN THIS DOCUMENT MUST BE MADE WITH ENGINEERING SUPERVISION AND ALL WORK MUST BE COMPLETED BY QUALIFIED PERSONNEL.
2.ALL EQUIPMENT AND TERMINALS MUST BE MINIMUM 75°C RATED.
3.ALL CONDUCTORS ARE COPPER, UNLESS OTHERWISE SPECIFIED.
4.TAPS ARE MADE USING LISTED DEVICES.

NOTE:
1. EACH SOLAREDGE S650B POWER OPTIMIZER POWER OPTIMIZER CONNECTED TO EACH MODULES.
2. EACH SOLAREDGE S650B POWER OPTIMIZER IS RAPID SHUTDOWN COMPLIANCE.
3. ALL DC FUSES SHOWN ARE CONNECTED EXTERNALLY TO THE INVERTER



OCPD CALCULATIONS
MAIN PANEL RATING: 800A, MAIN BREAKER RATING: 600A
LINE SIDE TAP INTERCONNECTION ALLOWABLE BACKFEED IS 600A
OCPD CALCULATIONS: INVERTER OVERCURRENT PROTECTION
= INVERTER O/P I X 1.25 = (139.5A X 3) X 1.25 = 523.13A => PV BREAKER/FUSE = 600A
TOTAL REQUIRED PV BREAKER/FUSE SIZE => 600A PV BREAKER/FUSE
THE DESIGNED INTERCONNECTION MEETS THE 705.11 REQUIREMENTS.

ELECTRICAL CALCULATIONS:
SYSTEM INFO:
165.00 kWp DC SYSTEM SIZE
(300)APTOS DNA-144-BF10-550W-DG (550W) MODULES,
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)
(300)SOLAREDGE S650B POWER OPTIMIZER
SYSTEM CHARACTERISTICS:
VMP - MAXIMUM POWER POINT VOLTAGE = 370V
VOC - MAXIMUM INVERTER SYSTEM VOLTAGE = 600V
IMP - RATED MAXIMUM POWER-POINT CURRENT = 139.50A
ISC - MAXIMUM CIRCUIT CURRENT = 139.50A
DC WIRE SIZING(TAG-1):
MAX CIRCUIT CURRENT = OPTIMIZER OUTPUT X 1.25 = 15A X 1 X 1.25 = 18.75A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(1)] X (CONDUIT FILL) [PER TABLE 310.15(C)(1)]
X (CONDUCTOR AMPACITY) [PER TABLE 310.16] = 0.96 X 0.8 X 55A = 42.24A
TERMINAL RATING, [PER CEC 110.14(C)] - 8 AWG, 60°C RATED = 40A
40A > 18.75A, SO THE TERMINAL RATING GOVERNS THE CONDUCTOR SIZING
ALSO, 42.24A > 15.00A, AND **8 AWG** IS SUFFICIENT.
AC WIRE SIZING(TAG-2):
MAX AC OUTPUT CURRENT = MAX INVERTER OUTPUT X 1.25 = 139.5A X 1.25 = 174.38A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(1)] X (CONDUIT FILL) [PER TABLE 310.15(C)(1)]
X (CONDUCTOR AMPACITY) [PER TABLE 310.16] = 0.96 X 1 X 195A = 187.20A
TERMINAL RATING, [PER CEC 110.14(C)] - 2/0 AWG , 75°C RATED = 175A
175A >174.38A, SO THE TERMINAL RATING GOVERNS THE CONDUCTOR SIZING
ALSO, 187.20A >139.5A, AND **2/0 AWG** IS SUFFICIENT
INVERTER OVER CURRENT PROTECTION
(INVERTER MAX CURRENT) X 1.25 = 139.5A X 1.25 = 174.38A --> 175A OVERCURRENT PROTECTION
AC ACCUMULATION PANEL TO POINT INTERCONNECTION(TAG-3):
NO OF PARALLEL FEEDERS = 02 (AL)
MAX AC OUTPUT CURRENT = MAX INVERTER OUTPUT X # OF INVERTERS X 1.25 = 139.5A X 3 X 1.25 = 523.13A/2 = 261.56A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(1)] X (CONDUIT FILL) [PER TABLE 310.15(C)(1)]
X (CONDUCTOR AMPACITY) [PER TABLE 310.16] = 0.96 X 1 X 430A = 412.80A
TERMINAL RATING, [PER CEC 110.14(C)] - 500 KCMIL , 75°C RATED = 380A
380A >261.56A, SO THE TERMINAL RATING GOVERNS THE CONDUCTOR SIZING
ALSO, 412.80A > 209.25A, AND **500 KCMIL** IS SUFFICIENT
OVER CURRENT PROTECTION
(MAX OUTPUT CURRENT) X # OF INVERTERS X 1.25 = 139.5A X 3 X 1.25 = 523.13A --> 600A OVERCURRENT PROTECTION
AC ACCUMULATION PANEL TO POINT INTERCONNECTION(TAG-4):
NO OF PARALLEL FEEDERS = 02 (AL)
MAX AC OUTPUT CURRENT =600A/2 =300A
ADJUSTED CONDUCTOR AMPACITY = (HIGH TEMP) [PER TABLE 310.15(B)(1)] X (CONDUIT FILL) [PER TABLE 310.15(C)(1)]
X (CONDUCTOR AMPACITY) [PER TABLE 310.16] = 0.96 X 1 X 430A=412.80A
TERMINAL RATING, [PER CEC 110.14(C)] - 500 KCMIL , 75°C RATED = 380A
380A >300A, SO THE TERMINAL RATING GOVERNS THE CONDUCTOR SIZING
ALSO, 412.80A >300A, AND **500 KCMIL** IS SUFFICIENT

CONDUIT SCHEDULE

TAG ID	CONDUIT SIZE	PARALLEL FEEDER	CONDUCTOR	NEUTRAL	GROUND	CONDUIT FILL%
1	1-1/2" PVC 1-1/2" PVC 1-1/2" PVC	1	(6) 8 AWG PV WIRE 2kV (6) 8 AWG PV WIRE 2kV (6) 8 AWG PV WIRE 2kV	NONE	(1) 6 AWG BARE COPPER	28.20
2	1-1/2" EMT	1	(3) 2/0 AWG THHN/THWN-2 (CU)	(1) 6 AWG THHN/THWN-2 (CU)	(1) 6 AWG THHN/THWN-2 (CU)	35.84
3	3" PVC/EMT	2	(3) 500 KCMIL THHN/THWN-2 (AL)	(1) 1/0 AWG THHN/THWN-2 (AL)	(1) 1/0 AWG THHN/THWN-2 (AL)	36.84/26.83
4	3" EMT	2	(3) 500 KCMIL THHN/THWN-2 (AL)	(1) 1/0 AWG THHN/THWN-2 (AL)	(1) 1/0 AWG THHN/THWN-2 (AL)	26.83

MODULE SPECIFICATIONS

MODEL	APTOS DNA-144-BF10-550W-DG (550W)
MODULE POWER @ STC	550W
OPEN CIRCUIT VOLTAGE:**Voc**	49.80V
MAX POWER VOLTAGE:**Vmp**	44.15V
SHORT CIRCUIT CIRCUIT:**Isc**	13.99A
MAX POWER CURRENT:**Imp**	12.45A

INVERTER SPECIFICATIONS

MODEL	SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)
POWER RATING	50000W
MAX OUTPUT CURRENT	139.5A
CEC WEIGHTED EFFICIENCY	97%
MAX INPUT CURRENT	139.5A
MAX DC VOLTAGE	600V

OPTIMIZER CHARACTERISTICS

MODEL	**SOLAREDGE S650B POWER OPTIMIZER**
MAX INPUT VOLTAGE	85 VDC
MAX OUTPUT VOLTAGE	80 VDC
MAX INPUT CURRENT	15 ADC
MAX OUTPUT CURRENT	15 ADC

DC VOLTAGE DROP CALCULATION

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT (IMP)	STRING VOLTAGE AT 2%DB (VMP)	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
MODULES	INVERTER 01	1	PVC	15	370	1	D AWG 08	Cu	0.000778	0.000672457	310	1.69%
MODULES	INVERTER 02	1	PVC	15	370	1	D AWG 08	Cu	0.000778	0.000672457	290	1.58%
MODULES	INVERTER 03	1	PVC	15	370	1	D AWG 08	Cu	0.000778	0.000672457	360	1.96%
											MAX Vdrop	1.96%
											AVERAGE Vdrop	1.74%

3 PHASE AC VOLTAGE DROP CALCULATION

SOURCE	TERMINATION	TAG	CONDUIT TYPE	CURRENT	VOLTAGE	#SET OF PARALLEL CONDUCTOR	CONDUCTOR	CONDUCTOR MATERIAL	RESISTENCE AT 75 DEG C	RESISTENCE AT 2%DB	MAX CONDUTOR LENGTH(ft)	%V.DROP
INVERTER 01	AC ACCUMULATION PANEL	2	EMT	139.5	208	1	K AWG 2/0	CU	0.0001	0.000086434	10	0.10%
INVERTER 02	AC ACCUMULATION PANEL	2	EMT	139.5	208	1	K AWG 2/0	Cu	0.0001	0.000086434	10	0.10%
INVERTER 03	AC ACCUMULATION PANEL	2	EMT	139.5	208	1	K AWG 2/0	CU	0.0001	0.000086434	10	0.10%
COLLECTION TO POI												
AC ACCUMULATION PANEL	NON FUSED AC DISCONNECT	3	PVC/EMT	418.5	208	2	R 500 KCMIL	Al	0.000048	0.000041347	190	1.37%
NON FUSED AC DISCONNECT	NGOM METER	3	EMT	418.5	208	2	R 500 KCMIL	Al	0.000048	0.000041347	10	0.07%
NGOM METER	FUSED AC DISCONNECT	3	EMT	418.5	208	2	R 500 KCMIL	Al	0.000048	0.000041347	10	0.07%
FUSED AC DISCONNECT	POI	4	EMT	418.5	208	2	R 500 KCMIL	Al	0.000048	0.000041347	10	0.07%
											MAX Vdrop	1.69%
											AVERAGE Vdrop	1.69%
											TOTAL SYSTEM VDROP	3.65%

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C** | MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i
ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

LINE DIAGRAM

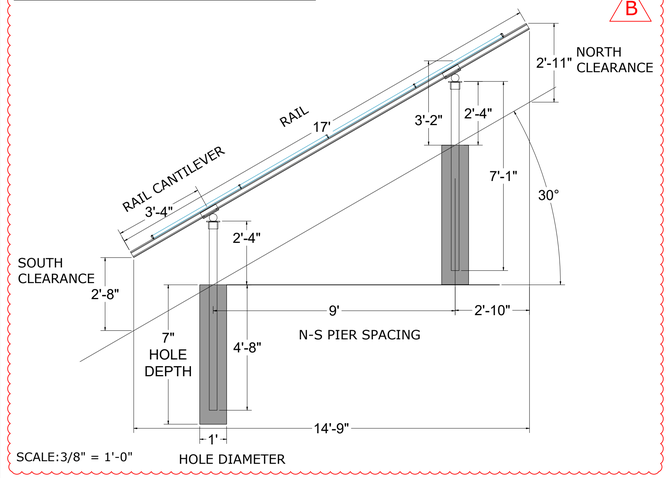
DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

PAPER SIZE: 24" X 36"

SCALE: AS NOTED | REV:B

DATE: 05/07/2025 | E-04

SIDE VIEW OF GROUND MOUNTING:



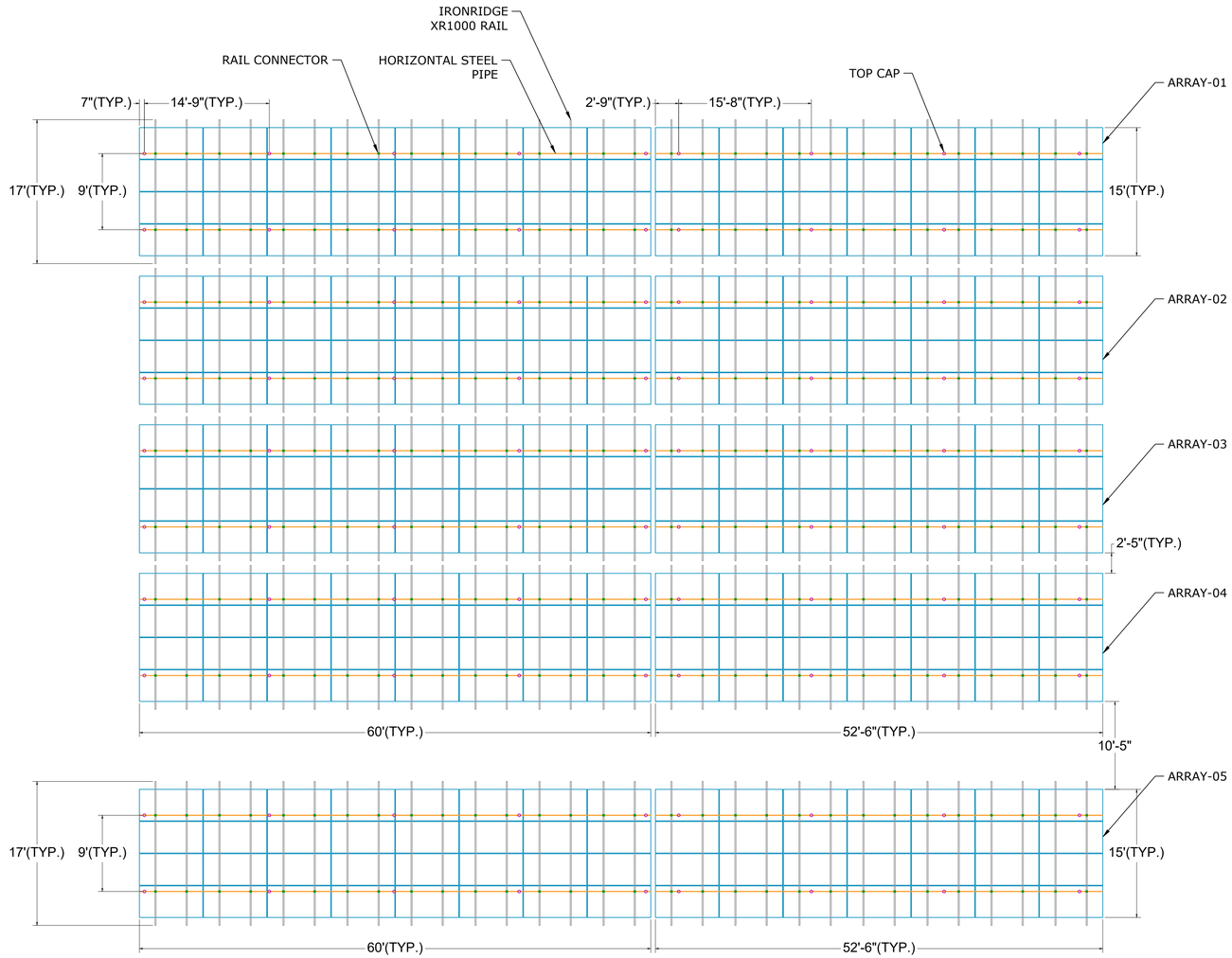
SCALE:3/8" = 1'-0"

SITE INFORMATION - WIND SPEED: 90 MPH, SNOW LOAD: 0 PSF, WIND EXPOSURE: B

ARRAY	QUANTITY	MODULE TILT	AZIMUTH
ARRAY-01	60	30°	184°
ARRAY-02	60	30°	184°
ARRAY-03	60	30°	184°
ARRAY-04	60	30°	184°
ARRAY-05	60	30°	184°

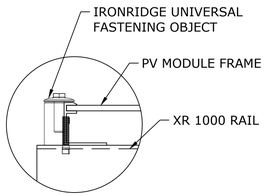
LEGEND:

- MODULES
- RAILS
- RAIL CONNECTOR
- TOP CAP
- HORIZONTAL STEEL PIPE



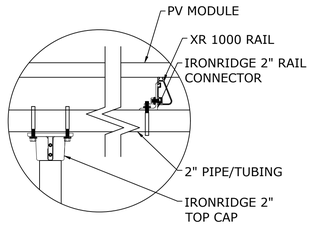
SCALE:1/8"=1'-0"

END CLAMPS DETAIL



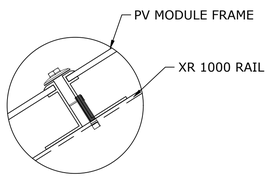
SCALE:NTS

PIPE FITTINGS DETAIL



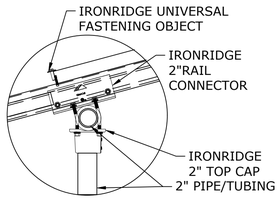
SCALE:NTS

MID CLAMPS DETAIL



SCALE:NTS

PIER AND RAIL ASSEMBLY



SCALE:NTS

GENERAL STRUCTURAL NOTES

1.ALL EQUIPMENTS SHALL BE INSTALLED PER MANUFACTURER INSTALLATION AND OPERATIONS MANUAL REQUIREMENTS.
2.PRIOR TO COMMENCEMENT OF WORK OR FABRICATION OF COMPONENTS, THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, DIMENSIONS AND ELEVATIONS OF THE EXISTING CONSTRUCTION. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN THE FIELD-VERIFIED CONDITIONS, DIMENSIONS AND ELEVATION AND THOSE INDICATED ON THE DRAWINGS.
3.ALL THE CONSTRUCTION SHALL COMPLY WITH REQUIREMENTS OF 2022 EDITION OF CALIFORNIA BUILDING CODE.

SOLAR RACK COMPONENTS:

1. FOLLOW MANUFACTURER'S INSTALLATION FOR INSTALLATION OF THE SOLAR COMPONENTS, INCLUDING MODULE CLAMPS, L-FEET, BRACKETS MECHANICAL ATTACHMENTS AND HARDWARE.

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C**	MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i

ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

STRUCTURAL DETAIL & ARRAY PLAN

DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

PAPER SIZE: 24" X 36"

SCALE: AS NOTED	REV:B
DATE: 05/07/2025	S-01

PLACARDS

⚠ WARNING

ELECTRIC SHOCK HAZARD
THE DC CONDUCTORS OF THIS PHOTOVOLTAIC SYSTEM ARE UNGROUNDED AND MAY BE ENERGIZED

INSTALLED ON: DC DISCONNECT, INVERTER
[TO BE USED WHEN INVERTER IS UNGROUNDED]

⚠ WARNING

ELECTRIC SHOCK HAZARD
DO NOT TOUCH TERMINALSON TERMINALS ON BOTH LINE AND LOAD SIDES MAY BE ENERGIZED IN THE OPEN POSITION

INSTALLED ON: AC DISCONNECT, POINT OF INTERCONNECTION
APPLICABLE CODE(S): CEC 690.13

WARNING-ELECTRIC SHOCK HAZARD NO USER SERVICEABLE PARTS INSIDE CONTACT AUTHORIZED SERVICE PROVIDE FOR ASSISTANCE

INSTALLED ON: INVERTER, JUNCTION BOXES(ROOF), AC DISCONNECT

SOLAR DISCONNECT

INSTALLED ON: DISCONNECT, POINT OF INTERCONNECTION
PER CODE: CEC690.13(B)

WARNING:PHOTOVOLTAIC POWER SOURCE

INSTALLED ON: CONDUIT, RACEWAYS, AND J-BOXES (LABELED EVERY 10'). REFLECTIVE. MIN 3/8" WHITE TEXT ON BLACK BACKGROUND.
APPLICABLE CODE(S): CEC 690.31(D)(2)

INVERTER 1 & 2

MAXIMUM DC VOLTAGE
600 V
OF PV SYSTEM

INSTALLED ON: INVERTER
APPLICABLE CODE(S): CEC 690.53

DEDICATED PHOTOVOLTAIC SYSTEM COMBINER PANEL NO LOAD SHALL BE ADDED TO THIS PANEL

INSTALLED ON: COMBINER PANEL

PHOTOVOLTAIC SYSTEM AC DISCONNECT SWITCH
RATED AC OPERATING CURRENT **418.50** AMPS AC
AC NOMINAL OPERATING VOLTAGE **208** VAC

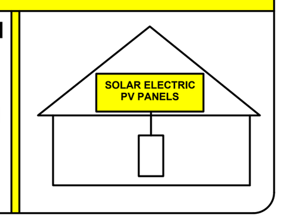
INSTALLED ON: AC DISCONNECT(S), POINT OF INTERCONNECTION.
APPLICABLE CODE(S): CEC 690.54

⚠ WARNING
DUAL POWER SOURCE SECOND SOURCE IS PHOTOVOLTAIC SYSTEM

INSTALLED ON: POINT OF INTERCONNECTION
APPLICABLE CODE(S): CEC 705.12(B)(3-4) AND 690.59

SOLAR PV SYSTEM EQUIPPED WITH RAPID SHUTDOWN

TURN RAPID SHUTDOWN SWITCH TO THE "OFF" POSITION TO SHUT DOWN PV SYSTEM AND REDUCE SHOCK HAZARD IN THE ARRAY



INSTALLED ON: WITHIN 3 FT OF SERVICE DISCONNECTING MEANS. MIN 3/8" BLACK TEXT ON YELLOW BACKGROUND & 3/16" BLACK TEXT ON WHITE BACKGROUND.
APPLICABLE CODE(S): CEC 690.56(C)

RAPID SHUTDOWN SWITCH FOR SOLAR PV SYSTEM

INSTALLED ON:RAPID SHUTDOWN SWITCH
APPLICABLE CODE(S): CEC 690.56(C)(2)

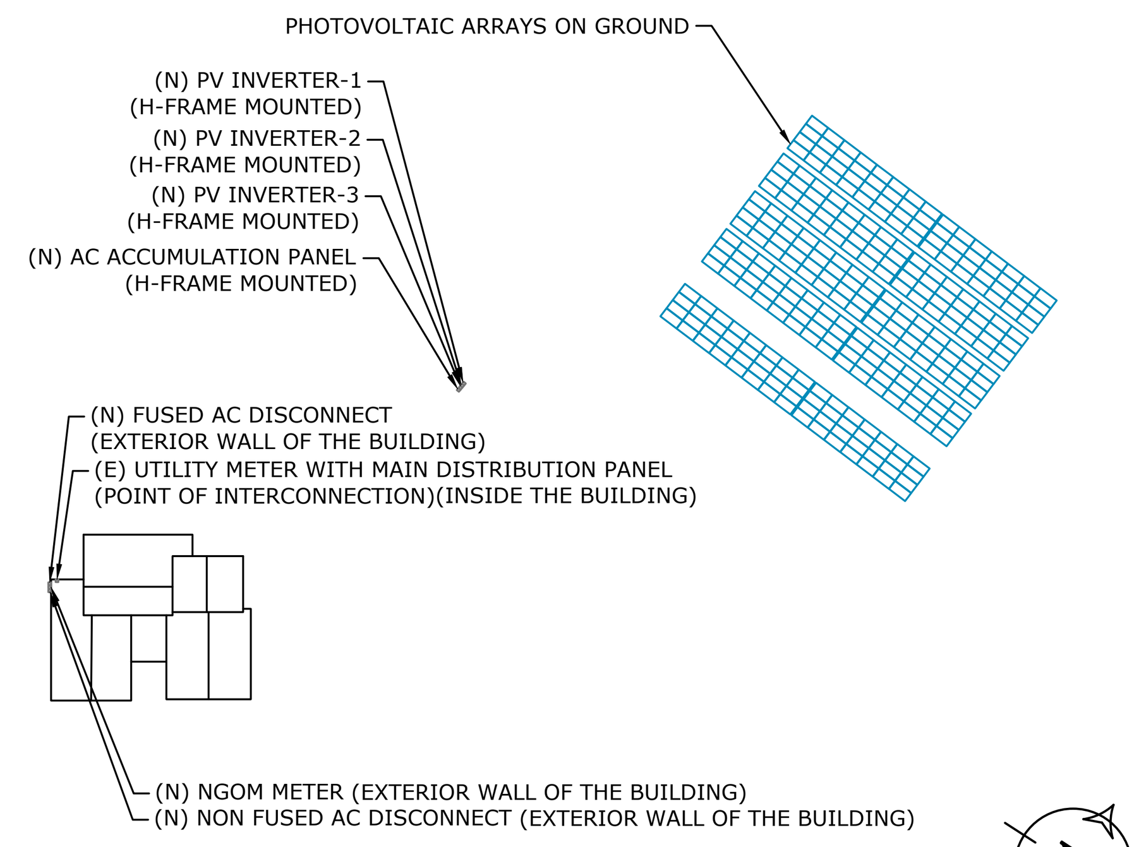
PHOTOVOLTAIC

SYSTEM METER

LABEL LOCATION:
DEDICATED kWh METER
PER CODE: CEC 690.4(B) UTILITY

CAUTION:MULTIPLE SOURCES OF POWER

POWER TO THIS BUILDING IS ALSO SUPPLIED FROM THE FOLLOWING SOURCES WITH DISCONNECTS LOCATED AS SHOWN



23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657

LABEL LOCATION
SERVICE PANEL
PER CODE: CEC 705.10

NOTES
1.PLACARDS SHALL MEET THE REQUIREMENTS OF ARTICLES 690 AND 705, UNLESS OTHERWISE SPECIFIED PER LOCAL AHJ REQUIREMENTS.
2.PLACARDS SHALL MEET THE REQUIREMENTS OF SECTION 110.21(B) AS REQUIRED AND SHALL COMPLY WITH ANSI Z535.4-2011, PRODUCT SAFETY SIGNS AND LABELS.
3.PLACARDS SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD.
4.PLACARDS SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED AND SHALL BE HANDWRITTEN.
5.PLACARDS SHALL NOT COVER EXISTING MANUFACTURER LABELS.

MODULE SPECIFICATION SHEET

aptos solar technology

DNA™ 144-Bifacial Dual Glass
Solar for Innovators

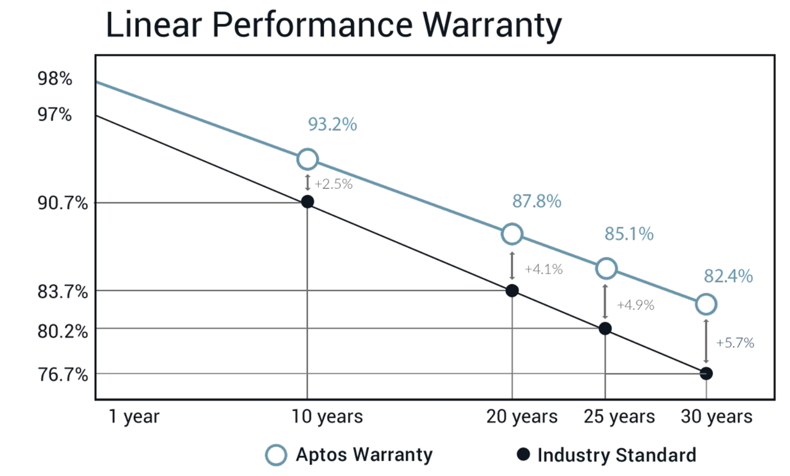
DNA-144-BF10-550W-DG
Residential | Commercial

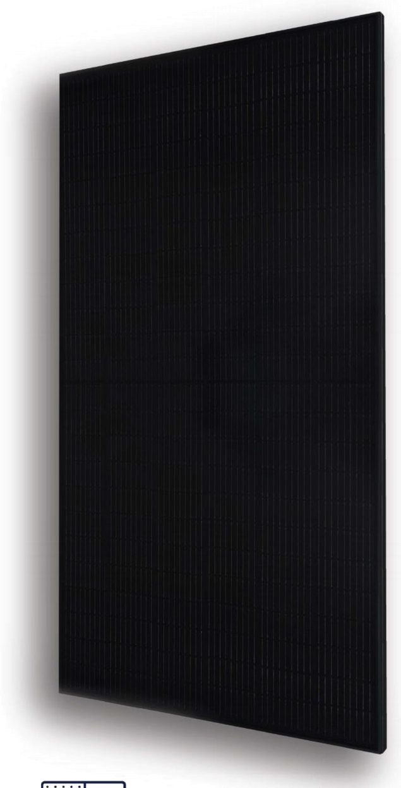
Our DNA Split Cell Series uses advanced selective emitter PERC technology with thin film layers to improve heat tolerance, maximize energy harvest, minimize resistive loss, and use 5% more of the available active area for optimal power performance.

Industry Leading 30 Years Product and Performance Warranty

540W | 545W | 550W

Linear Performance Warranty





Designed & Engineered In Silicon Valley

Key Features

Advanced Technology
Patented DNA™ technology boosts power performance & module efficiency.

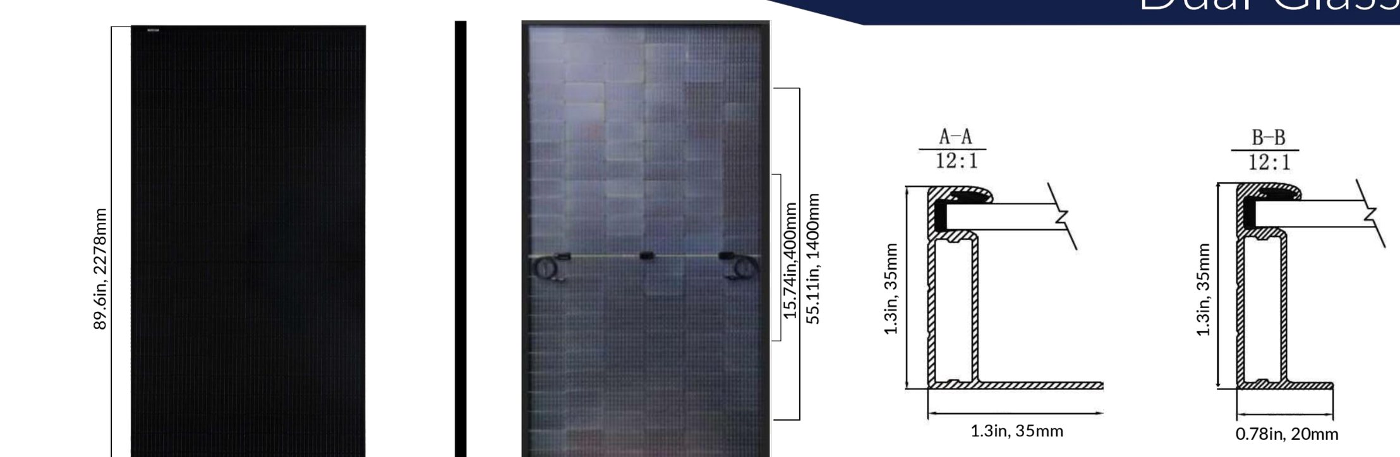
Durable Design
Robust product design is resilient in extreme weather. Up to 5400 Pa snow load and 4000 Pa wind load

Awards
Winners of the Leadership in Solar Energy award for three consecutive years and listed as one of the Top Solar Products from 2021-2022.

Bankable Investment
Comprehensive warranty that covers both **30-year product** and **30-year power** performance.

Aesthetics
All black design with advanced split cell technology features 10 ultra-thin busbars that allow for less resistance and greater energy harvest.

DNA™ 144 Bifacial Dual Glass



Electrical Specifications	DNA-144-BF10-540W-DG		DNA-144-BF10-545W-DG		DNA-144-BF10-550W-DG	
	STC	NOCT	STC	NOCT	STC	NOCT
Rated Output P_{mpp} (W)	540W	411W	545W	415W	550W	416W
Open Circuit Voltage V_{VOC} (V)	49.50	46.71	49.65	46.86	49.80	47.01
Short Circuit Current I_{SC} (A)	13.85	11.06	13.92	11.13	13.99	11.20
Rated Voltage V_{mp} (V)	43.84	39.21	44.00	39.36	44.15	39.15
Rated Voltage I_{mp} (A)	12.32	10.49	12.38	10.56	12.45	10.63
Module Efficiency	20.90%		21.09%		21.29%	

STC for front-face of panel: 1000 W/m², 25°C, measurement uncertainty ≤3%
NOCT for front-face of panel: 800W/m², 45°C, Wind speed 1 m/s

Bifacial Output-Rearside Power Gain			
5%-Maximum Power (Pmax)	567W	572W	578W
5%-Module Efficiency STC(%)	21.94%	22.14%	22.35%
15%-Maximum Power (Pmax)	621W	627W	633W
15%-Module Efficiency STC(%)	24.03%	24.27%	24.50%
25%-Maximum Power (Pmax)	675W	682W	688W
25%-Module Efficiency STC(%)	26.12%	26.40%	26.63%

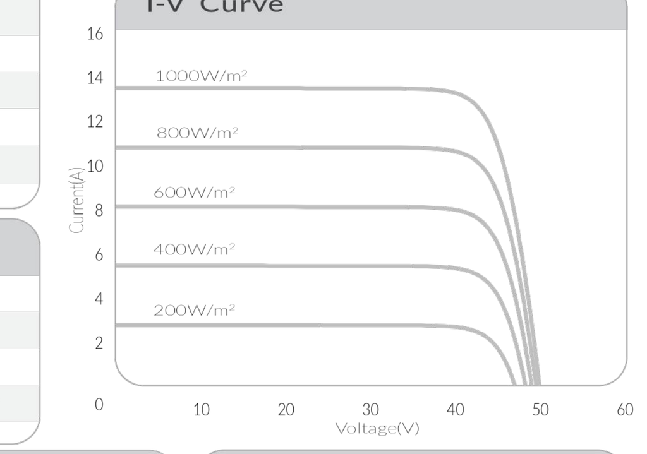
Test Operating Conditions	
Maximum Series Fuse	30A
Maximum System Voltage	1,500 VDC (UL&IEC)
Maximum Load Capacity (Per UL 1703)	5400 PA Snow Load / 4000 Pa Wind Load
Fire Performance Class	Type 29

Temperature Coefficents	
Temperature Coefficients P_{mmp}	-0.335%/°C
Temperature Coefficients I_{sc}	+0.036%/°C
Temperature Coefficients V_{OC}	-0.277%/°C
Normal Operating Cell Temperature (NOCT)	45°C±2°C

Packaging Configuration	
Modules per Pallet	31
Pallets per 40ft. Container	20
Pallet Dimensions	91.06 X 44.48 X 49.76 in
Pallet Weight (lbs)	2208
Modules per 40ft. Container	620

Mechanical Properties	
Cell Type	SE-PERC
Glass	Glass Thickness: Front Glass : 2mm Rear Glass : 2mm, AR Coating, High Transmission, Low Iron, Semi-Tempered Dual Glass
Frame	Anodized Aluminum Alloy
Junction Box	IP68
Dimensions	89.68 X 44.6 X 1.3 in, 2278 X 1134 X 35 mm
Weight	71.20 lbs
Output Cable	4mm² (EU)12AWG,(1200mm)
Cable Length	47.2in, 1200mm
Connector Type	Staubli EVO2

I-V Curve



Certifications

C22.2 No.61730-1:19
C22.2 No.61730-2:19
IEC61730-1
IEC61730-2
UL61730-1
UL61730-2

Ref_08.23.24

8207 Callaghan Rd, Ste 100,
San Antonio, Texas 78230
www.aptossolar.com I sales@aptossolar.com

Aptos Solar Technology reserves the right to make specification changes without notice.

INVERTER SPECIFICATION SHEET

Three Phase Inverter with Synergy Technology
For the 208V Grid for North America
SE50KUS

INVERTERS

Powered by unique pre-commissioning process for rapid system installation

- Pre-commissioning feature for automated validation of system components and wiring during the site installation process and prior to grid connection
- Easy 2-person installation with lightweight, modular design (each inverter consists of 3 Synergy units and 1 Synergy Manager)
- Independent operation of each Synergy unit enables higher uptime and easy serviceability
- Built-in thermal sensors detect faulty wiring ensuring enhanced protection and safety
- Built-in arc fault protection and rapid shutdown
- Built-in PID mitigation for maximized system performance
- Monitored* and field-replaceable surge protection devices, to better withstand surges caused by lightning or other events
- Built-in module-level monitoring with Ethernet or cellular communication for full system visibility

*Applicable only for DC and AC SPDs

solaredge.com

solaredge

Three Phase Inverter with Synergy Technology
For the 208V Grid for North America
SE50KUS

MODEL NUMBER APPLICABLE TO INVERTERS WITH PART NUMBER	SExxK-USx2Ixxxx SE50KUS	UNITS
OUTPUT		
Rated AC Active Output Power	50000	W
Maximum AC Apparent Output Power	50000	VA
AC Output Line Connections	3W + PE, 4W + PE	
Supported Grids	WYE: TN-C, TN-S, TN-C-S, TT, IT, Delta: IT	
AC Output Voltage Minimum-Nominal-Maximum(1) (L-N)	105 – 120 – 132.5	Vac
AC Output Voltage Minimum-Nominal-Maximum(1) (L-L)	183 – 208 – 229	Vac
AC Frequency Min-Nom-Max(1)	59.5 – 60 – 60.5	Hz
Maximum Continuous Output Current (per Phase, PF=1)	139.5	Aac
GFDI Threshold	1	A
Utility Monitoring, Islanding Protection, Configurable Power Factor, Country Configurable Thresholds	Yes	
Total Harmonic Distortion	≤ 3	%
Power Factor Range	+/-0.2 to 1	
INPUT		
Maximum DC Power (Module STC) Inverter / Synergy Unit	87500 / 29165	W
Transformer-less, Ungrounded	Yes	
Maximum Input Voltage DC+ to DC-	600	Vdc
Operating Voltage Range	370 – 600	Vdc
Maximum Input Current	3 x 46.5	Adc
Reverse-Polarity Protection	Yes	
Ground-Fault Isolation Detection	167kΩ sensitivity per Synergy Unit(2)	
CEC Weighted Efficiency	97	%
Nighttime Power Consumption	< 12	W
ADDITIONAL FEATURES		
Supported Communication Interfaces(3)	2 x RS485, Ethernet, Wi-Fi (optional), Cellular (optional)	
Smart Energy Management	Export Limitation	
Inverter Commissioning	With the SetApp mobile application using built-in Wi-Fi access point for local connection	
Arc Fault Protection	Built-in, User Configurable (According to UL1699B)	
Photovoltaic Rapid Shutdown System	NEC 2014, 2017 and 2020, Built-in	
PID Rectifier	Nighttime, built-in	
RS485 Surge Protection (ports 1+2)	Type II, field replaceable, integrated	
AC, DC Surge Protection	Type II, field replaceable, integrated	
DC Fuses (Single Pole)	25A, integrated	
Pre-Commissioning	Built-in(4)	
DC SAFETY SWITCH		
DC Disconnect	Built-in	
STANDARD COMPLIANCE		
Safety	UL1699B, UL1741, UL1741 SA, UL1741 SB, UL1998, CSA C22.2#107.1, Canadian AFCI according to T.I.L. M-07	
Grid Connection Standards	IEEE 1547-2018, Rule 21, Rule 14 (HI)	
Emissions	FCC part 15 class A	

(1) For other regional settings please contact SolarEdge support.
(2) Where permitted by local regulations.
(3) For specifications of the optional communication options, visit the Communication product page or the Resource Library to download the relevant product datasheet.
(4) Not available for P/Ns SExxK-xxxxxBPxx.

Three Phase Inverter with Synergy Technology
For the 208V Grid for North America
SE50KUS

MODEL NUMBER APPLICABLE TO INVERTERS WITH PART NUMBER	SExxK-USx2Ixxxx SE50KUS	UNITS
INSTALLATION SPECIFICATIONS		
Number of Synergy Units per Inverter	3	
AC Max Conduit Size	2 ½"	in
Max AWG Line / PE	4/0 / 1/0	
DC Max Conduit Size	1 x 3"; 2 x 2"	in
DC Input Inverter / Synergy Unit	12 / 4 pairs; 6 – 12 AWG	
	3 pairs / 1 pair, Max 2 AWG; copper or aluminum	
Dimensions (H x W x D)	Synergy Unit: 22 x 12.9 x 10.75 / 558 x 328 x 273 Synergy Manager: 14.17 x 22.4 x 11.6 / 360 x 560 x 295	in / mm
Weight	Synergy Unit: 70.4 / 32 Synergy Manager: 39.6 / 18	lb / kg
Operating Temperature Range	-40 to +140 / -40 to +60(5)	°F / °C
Cooling	Fan (user replaceable)	
Noise	< 67	dBA
Protection Rating	NEMA 3R	
Mounting	Brackets provided	

(5) For power de-rating information refer to the Temperature De-rating - Technical Note (North America).

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C** | MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i

ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

ELECTRICAL PLACARDS & SPEC SHEETS

DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

PAPER SIZE: 24" X 36"

SCALE: AS NOTED | REV:B

DATE: 05/07/2025 | E-05

OPTIMIZER SPECIFICATION SHEET

Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B

POWER OPTIMIZER

Enabling PV power optimization at the module level

- Specifically designed to work with SolarEdge residential inverters
- Detects abnormal PV connector behavior, preventing potential safety issues*
- Module-level voltage shutdown for installer and firefighter safety
- Superior efficiency (99.5%)
- Mitigates all types of module mismatch loss, from manufacturing tolerance to partial shading
- Faster installations with simplified cable management and easy assembly using a single bolt
- Flexible system design for maximum space utilization
- Compatible with bifacial PV modules

* Functionality subject to inverter model and firmware version

solaredge.com

solaredge

Power Optimizer

For Residential Installations

S440 / S500 / S500B / S650B

	S440	S500	S500B	S650B	UNIT
INPUT					
Rated Input DC Power(1)	440(2)	500(2)		650	W
Absolute Maximum Input Voltage (Voc)	60		125	85	Vdc
MPPT Operating Range	8 – 60		12.5 – 105	12.5 – 85	Vdc
Maximum Short Circuit Current (Isc) of Connected PV Module	14.5(2)	15			Adc
Maximum Efficiency	99.5				%
Weighted Efficiency	98.6				%
Overvoltage Category	II				
OUTPUT DURING OPERATION					
Maximum Output Current	15				Adc
Maximum Output Voltage	60		80		Vdc
OUTPUT DURING STANDBY (POWER OPTIMIZER DISCONNECTED FROM INVERTER OR INVERTER OFF)					
Safety Output Voltage per Power Optimizer	1 ± 0.1				Vdc
STANDARD COMPLIANCE(4)					
EMC	FCC Part 15 Class B, IEC61000-6-2, IEC61000-6-3, CISPR11, EN-55011				
Safety	IEC62109-1 (class II safety), UL1741				
Material	UL94 V-0, UV Resistant				
RoHS	Yes				
Fire Safety	VDE-AR-E 2100-712:2018-12				
INSTALLATION SPECIFICATIONS					
Maximum Allowed System Voltage	1000				Vdc
Dimensions (W x L x H)	129 x 155 x 30		129 x 165 x 45		mm
Weight	720		790		gr
Input Connector	MC4(5)				
Input Wire Length	0.1				m
Output Connector	MC4				
Output Wire Length	(+) 2.3; (-) 0.10				m
Operating Temperature Range(6)	-40 to +85				°C
Protection Rating	IP68				
Relative Humidity	0 – 100				%

(1) Rated power of the module at STC will not exceed the Power Optimizer Rated Input DC Power. Modules with up to +5% power tolerance are allowed.
(2) For installations after April 1st, 2024, the Rated Input DC Power for S440 is 490W, and the Maximum Isc of Connected PV Module is 15A.
(3) For installations after April 1st, 2024, the Rated Input DC Power for S500 and S500B is 550W.
(4) For details about CE compliance, see Declarations of Conformity – C4.
(5) For other connector types please contact SolarEdge.
(6) Power derating is applied for ambient temperatures above +85°C for S440 and S500, and for ambient temperatures above +75°C for S500B. Refer to the Power Optimizers Temperature Derating technical note for details.

PV System Design Using a SolarEdge Inverter(7)		SolarEdge Home Wave Inverter Single Phase	SolarEdge Home Short String Inverter Three Phase	Three Phase for 230/400V Grid	Three Phase for 277/480V Grid	
Minimum String Length (Power Optimizers)	S440, S500	8	9	16	18	
	S500B, S650B	6	8	14		
Maximum String Length (Power Optimizers)		25	20	50		
Maximum Continuous Power per String		5700	5625	11,250	12,750	W
Maximum Allowed Connected Power per String(8) (In multiple string designs, the maximum is permitted only when the difference in connected power between strings is ≥2000W or less)		6800(9)	See(8)	13,500	15,000	W
Parallel Strings of Different Lengths or Orientations		Yes				

(7) It is not allowed to mix S-series and P-series Power Optimizers in new installations in the same string.
(8) If the inverter's rated AC power is the maximum continuous power per string, then the maximum connected power per string will be able to reach up to the inverter's maximum input DC power. Refer to the Single String Design Guidelines application note for details.
(9) For inverters with a rated AC power ≥ 8000W that are connected to at least two strings.

CE RoHS

ATTACHMENT SPECIFICATION SHEET

Datasheet

IRONRIDGE

Ground Mount System

All-Terrain Mounting

The IronRidge Ground Mount System combines our XR100 or XR1000 rails with locally-sourced steel pipes or mechanical tubing, to create a cost-effective structure capable of handling any site or terrain challenge.

Installation is simple with only a few structural components and no drilling, welding, or heavy machinery required. In addition, the system works with a variety of foundation options—including concrete piers, ground screws, helical or driven piles, and above-ground ballast blocks.

Rugged Construction
Engineered steel and aluminum components ensure durability.

PE Certified
Pre-stamped engineering letters available in most states.

UL 2703 Listed System
Meets newest effective UL 2703 standard.

Design Software
Online tool generates engineering values and bill of materials.

Flexible Architecture
Multiple foundation and array configuration options.

25-Year Warranty
Products guaranteed to be free of impairing defects.

Datasheet

360° Product Tour
Visit ironridge.com

Substructure

Top Caps

Connect vertical and cross pipes.

Bonded Rail Connectors

Attach and bond Rail Assembly to cross pipes.

Diagonal Braces

Optional Brace provides additional support.

Cross Pipe & Piers

Steel pipes or mechanical tubing for substructure.

Rail Assembly

XR100/XR1000 Rails

Curved rails increase spanning capabilities.

UFOs

Universal Fastening Objects bond modules to rails.

Stopper Sleeves

Snap onto the UFO to turn into a bonded end clamp.

CAMO

Bond modules to rails while staying completely hidden.

Resources

Design Assistant
Go from rough layout to fully engineered system. For free.
Go to ironridge.com/design

NABCEP Certified Training
Earn free continuing education credits, while learning more about our systems.
Go to ironridge.com/training

RAIL SPECIFICATION SHEET

Tech Brief

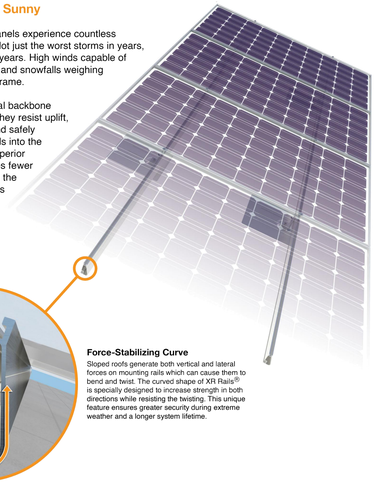
IRONRIDGE

XR Rail® Family

Solar Is Not Always Sunny

Over their lifetime, solar panels experience countless extreme weather events. Not just the worst storms in years, but the worst storms in 40 years. High winds capable of ripping panels from a roof, and snowfalls weighing enough to buckle a panel frame.

XR Rails® are the structural backbone preventing these results. They resist uplift, protect against buckling and safely and efficiently transfer loads into the building structure. Their superior spanning capability requires fewer roof attachments, reducing the number of roof penetrations and the amount of installation time.



Force-Stabilizing Curve
Sloped roofs generate both vertical and lateral forces on mounting rails which can cause them to bend and twist. The curved shape of XR Rails® is specially designed to increase strength in both directions while resisting the twisting. This unique feature ensures greater security during extreme weather and a longer system lifetime.

Compatible with Flat & Pitched Roofs

XR Rails® are compatible with FlashFoot® and other pitched roof attachments.

IronRidge® offers a range of tilt leg options for flat roof mounting applications.

Corrosion-Resistant Materials

All XR Rails® are made of 6000-series aluminum alloy, then protected with an anodized finish. Anodizing prevents surface and structural corrosion, while also providing a more attractive appearance.

Tech Brief

XR Rail® Family

The XR Rail® Family offers the strength of a curved rail in three targeted sizes. Each size supports specific design loads, while minimizing material costs. Depending on your location, there is an XR Rail® to match.

XR10

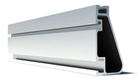
XR10 is a sleek, low-profile mounting rail, designed for regions with light or no snow. It achieves spans up to 6 feet, while remaining light and economical.

- 6' spanning capability
- Moderate load capability
- Clear & black anodized finish
- Internal splices available

XR100

XR100 is a residential and commercial mounting rail. It supports a range of wind and snow conditions, while also maximizing spans up to 10 feet.

- 10' spanning capability
- Heavy load capability
- Clear & black anodized finish
- Internal splices available



XR1000

XR1000 is a heavyweight among solar mounting rails. It's built to handle extreme climates and spans up to 12 feet for commercial applications.

- 12' spanning capability
- Extreme load capability
- Clear anodized finish
- Internal splices available

Rail Selection

The table below was prepared in compliance with applicable engineering codes and standards.* Values are based on the following criteria: ASCE 7-16, Gable Roof Flush Mount, Roof Zones 1 & 2e, Exposure B, Roof Slope of 8 to 20 degrees and Mean Building Height of 30 ft. Visit IronRidge.com for detailed certification letters.

Load		Rail Span					
Snow (PSF)	Wind (MPH)	4'	5' 4"	6'	8'	10'	12'
None	90	XR10		XR100		XR1000	
	120						
	140						
	160						
20	90						
	120						
	140						
	160						
30	90						
	160						
40	90						
	160						
80	160						
120	160						

*Table is meant to be a simplified span chart for conveying general rail capabilities. Use approved certification letters for actual design guidance.

SPECIFICATION SHEET

aloha SOLAR POWER & Electrical Services Inc.

SYSTEM INFORMATION

SYSTEM SIZE (DC/AC):
165.00 kWp DC / 150.00 kW AC

MODULES:
(300)APTOS DNA-144-BF10-550W-DG (550W)

INVERTERS:
(3)SOLAREDGE TECHNOLOGIES SE50KUS (208/120V, 3PH)

OPTIMIZER:
(300)SOLAREDGE S650B POWER OPTIMIZER

WIND SPEED: **90MPH**
SNOW LOAD: **0PSF**
EXPOSURE CAT: **B**

AHJ:**CA - CITY OF NEWPORT BEACH**

UTILITY:**SDGE**

MIN. TEMP.: **3.4°C** | MAX. TEMP.: **31.6°C**

SOLAR PV PROJECT:

MARRIOTT
23000 NEWPORT COAST DR, NEWPORT COAST, CA 92657
33.583531, -117.837117
PROJECT #LPE-DG-2024-516

REVISION HISTORY

REV	DATE	DESCRIPTION
A	12.11.2024	PERMIT PLAN
B	05.07.2025	AHJ REJECTION

ILLUMINE i

ILLUMINE INTERNATIONAL INC.
1320 ARROW POINT DR, STE 501, #163
CEDAR PARK, TX 78613

SPEC SHEETS

DESIGNED BY/CHECKED BY:
ABHI.H/MANISH ARJUNAN

PAPER SIZE: 24" X 36"

SCALE: AS NOTED | REV:B

DATE: 05/07/2025 | E-05.1